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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/898,364	07/03/2001	Andrew John Schofield	GB920000099US1	1081

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EXAMINER

FLEURANTIN, JEAN B

ART UNIT	PAPER NUMBER
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2172

DATE MAILED: 07/15/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/898,364

Applicant(s)

SCHOFIELD, ANDREW JOHN

Examiner

Jean B Fleurantin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

1. Claims 1-8 are presented for examination.

***Drawings***

2. The Examiner accepts the drawings.

***Priority***

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

***Claim Rejections - 35 U.S.C. § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1- 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,067,550 issued to Lomet ("Lomet").

As per claims 1 and 4, Lomet teaches a method for logging updates to a plurality of data records into discrete pages in nonvolatile storage, wherein a page partially full of data is known as a partial page (see col. 9, lines 34-35), as claimed said method comprises the steps of establishing identical partial pages I and I+1 at the earliest opportunity, in response to a data segment D larger than the remaining space of a most recent updated partial page I (thus, the application state is treated as a single object that can be automatically flushed to the stable

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database, in addition the application operations often cause changes to the data pages, records or other types of objects stored in the volatile cache, the modified objects that result from application operations are from time to time flushed to the stable database; which is readable as establishing identical partial pages I and I+1 at the earliest opportunity, in response to a data segment D larger than the remaining space of a most recent updated partial page I)(see col. 6, lines 20-25), partitioning D into a first segment D1 sufficient to fill the remaining space of page I and a second data segment D2, filling page I with a first write operation of its present contents concatenated with D1 (thus, a volatile main memory that does not persist across a system crash and a stable memory that persists across a system crash, the volatile memory includes a volatile cache which maintains cached states of the application address space and data records and a volatile log which tracks the operations performed by the computer system, the stable memory includes a stable database which stores stable states of the application address space and data records and a stable log which holds a stable version of the log records that describe state changes to the stable database; partitioning D into a first segment D1 sufficient to fill the remaining space of page I and a second data segment D2, filling page I with a first write operation of its present contents concatenated with D1)(see cols. 5-6, lines 61-4), and

creating identical partial pages I+1 and I+2 with a single, second write operation of D2 to both pages (thus, the write optimization technique comes at the expense of introducing more flush order dependencies to ensure proper installation of operations, in the read optimization case described in the preceding section, flush order dependencies are comparatively easy to handle, the dependency chain is at most one link in length the application state in a read dependency has no predecessors and hence nothing ever needs to be flushed before the

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application state itself, when the cache manager decides to flush an object, it flushes all predecessor objects "i.e., any predecessor application objects" and then the subject object, the read dependencies are thus "acyclic," meaning that each object can be flushed atomically independently of other objects in a prescribed order without requiring the simultaneous atomic flushing of multiple objects; which is readable as creating identical partial pages I+1 and I+2 with a single, second write operation of D2 to both pages)(see col. 7, lines 10-15). But, Lomet does not explicitly indicate whereby pages I+1 and I+2 become the new pages I and I+1 for the next logging operation. However, Lomet implicitly indicates change application state and can be posted to a stable log so that the operations can be replayed during recovery; which is readable as whereby pages I+1 and I+2 become the new pages I and I+1 for the next logging operation, (see col. 10, lines 51-60). Further, in columns 33-34, lines 60-9, Lomet teaches the log sequence number for the log record 272-278, are  $n$ ,  $n+g$ ,  $n+h$  and  $n+i$ . It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the teachings of Lomet with whereby pages I+1 and I+2 become the new pages I and I+1 for the next logging operation. This modification would allow the teachings of to improve the accuracy and the reliability of the data logging method, apparatus, system and computer program, and provide simultaneous execution of multiple applications, (see col. 10, lines 32-33).

As per claims 2 and 3, in addition to the discussion in claim 1, Lomet further teaches that point writing page I to the value of the most recent update concatenated with the new segment X in a first write operation and writing any remaining part of segment X into both pages I+1 and I+2 in a second write operation (thus, the write optimization technique comes at the expense of introducing more flush order dependencies to ensure proper installation of operations, in the

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read optimization case described in the preceding section, flush order dependencies are comparatively easy to handle, the dependency chain is at most one link in length the application state in a read dependency has no predecessors and hence nothing ever needs to be flushed before the application state itself, when the cache manager decides to flush an object, it flushes all predecessor objects "i.e., any predecessor application objects" and then the subject object, the read dependencies are thus "acyclic," meaning that each object can be flushed atomically independently of other objects in a prescribed order without requiring the simultaneous atomic flushing of multiple objects; which is readable as writing page I to the value of the most recent update concatenated with the new segment X in a first write operation and writing any remaining part of segment X into both pages I+1 and I+2 in a second write operation)(see col. 7, lines 10-15).

As per claim 5, in addition to the discussion in claim 1, further teaches means for thereafter alternating this procedure between pages I and I+1 until a data segment X fills the remaining space of the page containing the most recent update, and means for writing page I to the contents of the page containing the most recent update concatenated with the last received data segment X (thus, the log excerpt shows five log records 272-280 pertaining to operations that affect data object O, the first log record 272 contains the object ID "O" and state ID "n" to reflect that the data object O was written or updated to a state tagged with a state ID of "n," two subsequent log record 274 and 276 reflect that the data object O is written two more times at states  $n+g$  and  $n+h$ . A fourth log record 278 reflects that the entire value for the data object O at state  $n+h$  (i.e.,  $O_{\text{sub}.n+h}$ ) is written to the stable log, as is the case for a blind write operation at a state ID of " $n+i$ "; which is readable as alternating this procedure between pages I and I+1 until a

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data segment X fills the remaining space of the page containing the most recent update, and means for writing page I to the contents of the page containing the most recent update concatenated with the last received data segment X)(see cols. 33-34, 63-9).

As per claim 6, in addition to the discussion in claim 1, Lomet further teaches means for thereafter continuing this procedure into successive pages I+2, I+3, etc. until a data segment X fills the remaining space of the page containing the most recent update (thus, the log sequence number for the log record 272-278, are n, n+g, n+h and n+I; which is readable as )(see cols. 33-34, 63-9).

As per claims 7 and 8, the limitations of claims 7 and 8 are rejected in the analysis of claim 1, and these claims are rejected on that basis.

***Prior Art***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Lomet US Patent Number 6,490,594, relates to database computer systems.

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***Contact Information***

6. Any inquiry concerning this communication from examiner should be directed to Jean Bolte Fleurantin at (703) 308-6718. The examiner can normally be reached on Monday through Friday from 7:30 A.M. to 6:00 P.M.

If any attempt to reach the examiner by telephone is unsuccessful, the examiner's supervisor, Mrs. KIM VU can be reached at (703) 305-8449. The FAX phone numbers for the Group 2100 Customer Service Center are: *After Final* (703) 746-7238, *Official* (703) 746-7239, and *Non-Official* (703) 746-7240. NOTE: Documents transmitted by facsimile will be entered as official documents on the file wrapper unless clearly marked "***DRAFT***".


Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group 2100 Customer Service Center receptionist whose telephone numbers are (703) 306-5631, (703) 306-5632, (703) 306-5633.



Jean Bolte Fleurantin

07/10/03

JBf/



JEAN M. CORRIELUS  
PRIMARY EXAMINER